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ONTARIO WATER  
RESOURCES COMMISSION

## ANNUAL REPORT

1961

TOWN OF MEAFORD

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ANNUAL REPORT

ON

TOWN OF MEAFORD

WATER TREATMENT PLANT

OWRC PROJECT - 59-W-29

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GENERAL

In 1957, the Town of Meaford entered into an agreement with the Ontario Water Resources Commission whereby the Commission would finance the construction of a water treatment plant for the town.

Construction began in June of 1959 and upon completion of the intake structures and low lift pumping station in February of 1960, this part of the plant was placed in operation. Work continued on the filtration plant and high lift pumping station and in December of 1960, the entire plant was placed in operation.

## PLANT DESCRIPTION

The intake of the Meaford Water Treatment Plant consists of 30 inch diameter reinforced concrete pipe extending 850 feet into Georgian Bay with the intake in 20 feet of water.

The water from Georgian Bay flows by gravity into the low lift pumping station wet well through coarse screens and is pumped from there to the filter plant by one of two Canadian Fairbanks-Morse vertical turbine pumps, each capable of delivering 3.0 million Imperial gallons per day against a total dynamic head of 55 feet. In addition to the electric motors on the pumps, one is equipped with a gasoline engine standby unit for use in case of power failure. The pumps automatically alternate in service.

The pumped water is chlorinated as it enters the filter plant by a semi-automatic V-notch gas chlorinator capable of a maximum dosage of 40 pounds of chlorine per day. (1.3 ppm at 3.0 mgd) The chlorinated water is then discharged to the filter beds.

Two filters, each 25 feet by 25 feet in surface dimension, are provided. These are of the gravity, mechanical type with graded anthrafilt media and block underdrain system. Each filter has a design capacity of 1.5 mgd with the actual rate of flow controlled by a Bristol pneumatic controller. The rates of flow and head losses through the filters are recorded on receivers mounted in the control office.

The filtered water is stored in a 250,000 Imperial gallon well reservoir directly under the building. As demand for water is shown by a drop in the elevation of water in the Town's elevated tank, the high lift centrifugal automatically pumps water from the clear well into the distri-

bution system and to the elevated tank. At a predetermined water elevation, the high lift pump shuts off. The No. 1 high lift pump is electrically driven and is capable of delivering 1150 Imperial gallons per minute at a total head of 172 feet. The No. 2 high lift pump is driven by a manually started diesel engine and is capable of delivering 2,000 Imperial gallons per minute against a total dynamic head of 182 feet.

Backwashing of the filters when necessary (usually every 48 hours) is accomplished by pumping water from the clear well through the filters from the bottom up, and draining the water to waste. The backwash has a capacity of 6,250 Imperial gallons per minute against a total dynamic head of 38 feet. To assist in backwashing and to reduce the amount of water required, the filters are provided with Palmer surface agitators.

#### PLANT OPERATION

The plant was placed in initial operation (somewhat prematurely, it is felt) on December 12, 1960, and was immediately taken out of service for proper sterilization. The high lift pumping service was restarted on December 20, but the filters remained out of service until March 3.

During this period and continuing on until June 21, the actual operating control of the plant was in some doubt. The Meaford PUC claimed control on the basis of past performance and an alleged verbal agreement with the the OWRC. The OWRC claimed control under provision of the Act. At a meeting between OWRC and PUC representatives in Toronto on June 21, it was agreed that Murray Cook, Water Works Superintendent at the Meaford P.U.C., would take over as Chief Operator of the plant as a part time employee of the OWRC, and that the OWRC would retain control of the plant. Murray Cook

was undoubtedly the most qualified man for the job, and has proven to be extremely conscientious and efficient in his work.

Throughout the year, many minor mechanical deficiencies showed up in the plant. In most cases, these were rectified quite easily. However, in the case of the air compressors and associated equipment supplying air to the Bristol controls, the problem was a bit more serious. This problem culminated in a meeting in the OWRC offices on November 2, 1961 at which representatives of the various companies concerned agreed to place all the equipment in perfect working order and extend the warrantee period an additional six months. If the equipment does not prove satisfactory, it will be replaced in the coming year.

A side effect of the operation of the high lift pumps showed up soon after the initial operation. This was a serious air entrainment problem occurring in a school to the west of the town. An investigation showed that a surge was occurring in the water mains when the pumps shut off, and this drew air into the school system. The problem has apparently been cured by installing a check valve on the school service connection.

In general, the operation of this plant has been plagued through the year with the normal problems of a new plant, intensified by the unsatisfactory operation of the plant control air compressors. An added problem was the question of control of the operation. It is felt that these problems have for the most part been resolved and the operation in the coming year will be relatively trouble free.

#### PLANT PERFORMANCE

On the accompanying Graph No. 1, the average daily flows are shown plotted on a weekly basis. As can be seen the graph records were not kept

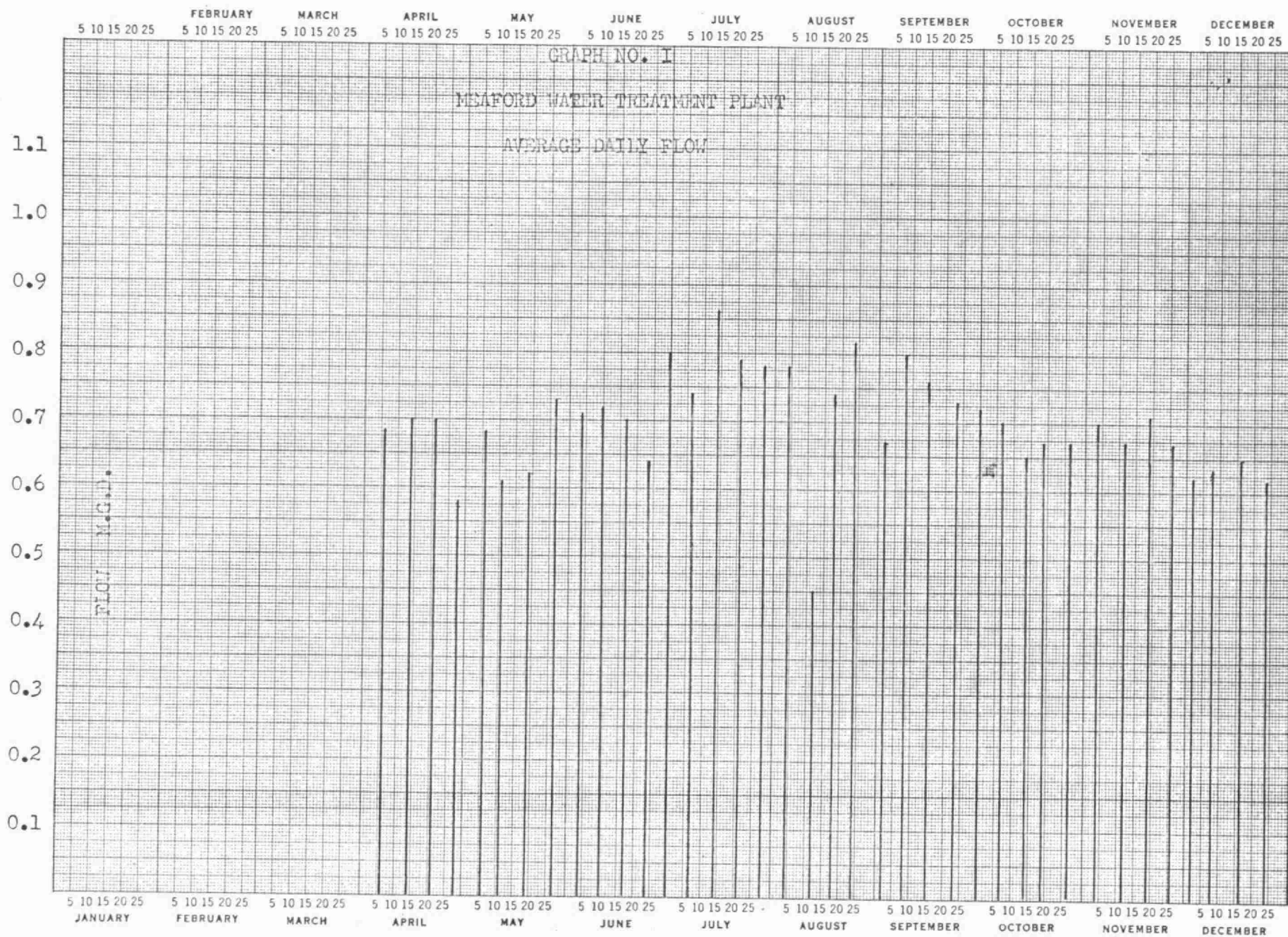
PLANT PERFORMANCE - Continued

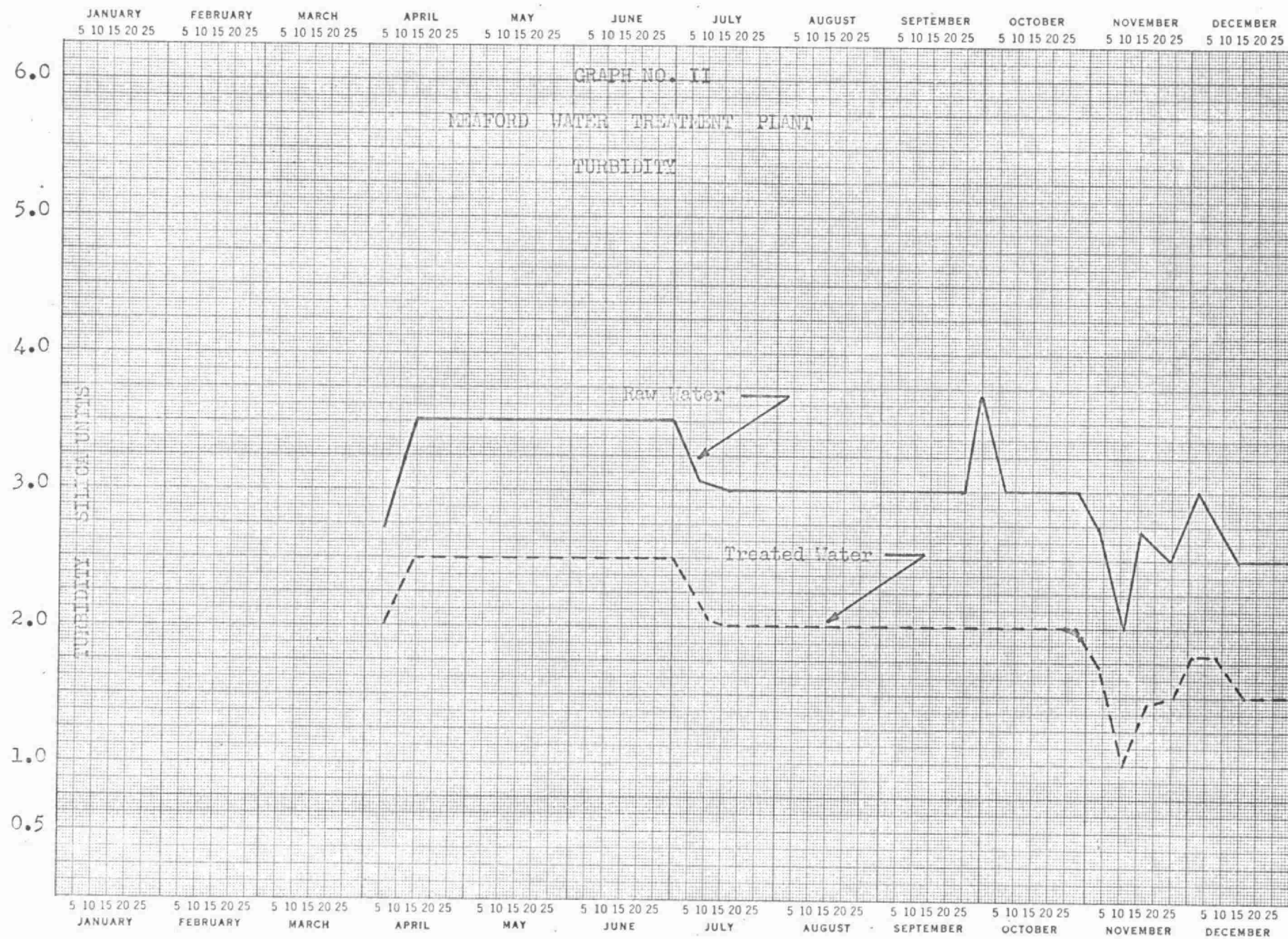
prior to April 1 of 1961. The average daily flow during the recorded period was approximately 600,000 gallons (see graph) with a maximum of 0.865 mgd and a minimum of 0.455 mgd. Since April, a total of approximately 187.3 million gallons has been pumped.

Graph No. 2 shows the reduction in turbidity effected by the filters for the recorded period. The raw water turbidity had a maximum average of 3.5 silica units and the filters reduced this to 2.5 silica units. This is not a great reduction by filtration but the raw water to date has had an extremely low turbidity. This is considered normal with this type of filter and the low turbidity of the raw water. Any further reduction in the turbidity of the treated water could only be obtained by further treatment of the raw water in the form of chemical coagulation. This would, of course, require the provision and installation of chemical feed equipment and clarification tanks. The treated water, at present, is well below the water quality objectives of the OWRC of 5 ppm turbidity. The cost of operating the filters in conjunction with the rest of the equipment is negligible and this is the only reason for them not being taken out of service. From a turbidity standpoint, the raw water is quite acceptable. It is felt, however, that during the spring season (for which records are not available) the turbidity of the raw water will be increased and the filters will be of value.

In summary, the performance of the plant has not produced any spectacular improvement in the quality of water supplied to the town, but it has been provided excellent water in more than adequate amounts. There is also an ample supply for the present and foreseeable future demand. There appears no necessity for expansion of the plant in the foreseeable future.







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